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ABSTRACT

A brief examination of research on the relationships among the training of teachers, their classroom behavior, and the learning of children suggests a general framework for studying both the intermediate and ultimate effects of teacher training. The idea behind this model is that such effects are more plausibly demonstrated if the argument is broken down into several intermediate steps between training activity and child growth. Each step is claimed to affect the next, and the demonstration addresses the truth of each of these claims. This booklet is intended to help the teacher examine the effects of training efforts in ways that lead to convincing demonstration of their effects. Outlines are presented on the following topics: (1) questions and answers about demonstrating effects; (2) evidence that demonstrates effects; (3) planning the demonstration of effects; (4) judging the evidence; (5) a model for demonstrating training effects; (6) measurement issues in demonstrating effects; and (7) sources and resources on demonstrating effects. (JD)

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DEMONSTRATING THE EFFECTS OF TEACHER TRAINING EFFORTS

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WHAT THIS IS ABOUT

All of us look for new ideas and better ways of doing things. And often, we are forced to try a new idea ourselves to find out if it works because there is no evidence about its effects. There are many reasons why we don't demand such evidence for the new ideas we try, and many excuses for not collecting such evidence for our own ideas -- we don't have time, it can't be done, no one would listen anyway, the effects of what we do cannot be measured. Traditional approaches to educational evaluation, with their high standards and high costs, and with their emphasis on scientific rigour have given us good reason to be sceptical about demonstrating effects.

We need to recognize that some evidence which demonstrates effects is better than none at all. We need to recognize that each of us can collect some information no matter what our constraints on resources and expertise. If our efforts fall far short of what the evaluation experts would recommend, they still may yield results of substantial worth to us.

These materials are intended to help you examine the effects of your training efforts in ways that lead directly to a convincing demonstration of their effects. Please give us your feedback, using the self-mailing feedback card included in the package, to help us reach this objective.

We hope you find these materials interesting and useful !!!

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- o JDRP - Joint Dissemination Review Panel

QUESTIONS AND ANSWERS ABOUT DEMONSTRATING EFFECTS

What is a claims-based demonstration of effect? A demonstration of effects presents information about an educational practice which argues that it has had certain impacts on those it serves. Specific claims are made that the practice has reliable effects, and evidence is presented to convince a sceptical audience that these claims are indeed true. Claims of effectiveness are initially selected from the beliefs of program staff and others about the effects of the practice. Existing information is then reviewed to see if there is sufficient evidence to support each claim. Where existing evidence is not convincing, then new evidence may be gathered or the claim may be dropped from the demonstration. The final demonstration consists of a brief document that succinctly describes the practice, states the claims, and summarizes the evidence supporting each claim.

What is a claims-based demonstration of effects good for? An educational practice should be examined to see if it works before it is widely disseminated. By spelling out clearly what a practice claims to do and by giving convincing evidence that the claimed effects actually occur, a developer shows the market that its innovative practices are worthy of adoption. In addition to supporting dissemination, a demonstration of effects is useful in showing funding agents and other sources of support that a development effort has been successful. Also, an attempt to demonstrate effects often reveals weaknesses in an evaluation design by highlighting gaps between the claims a staff would like to make and the evidence that is actually available. Finally, as a succinct statement of impact, a claims-based demonstration may be used to publicize the accomplishments of a project in any number of ways.

Does the demonstration of effects require rigorous scientific evaluation? The purpose of a demonstration of effects is to convince an audience that a practice is effective, and many types of evidence can be helpful in achieving this purpose. High quality evidence collected through carefully planned evaluations may be more convincing, but it is not required to demonstrate effects. It is more important to make some demonstration using whatever evidence is available than to insist on high standards of scientific validity. Once claims are identified and available evidence assembled, evaluation processes can be improved to make the demonstration more convincing.

Must a demonstration prove that the practice caused the observed effects? The desired effects of most training are somewhat removed from the training itself, and hence many other factors can affect the relationship between a training practice and its intended effects. Thus it is impossible to conclusively prove that a training practice is the sole cause of an observed effect; at best we can rule out some of the most plausible alternative explanations for the effects we observe. But what is most important is to determine if the intended effects indeed occurred.

How much time does this all take? An initial demonstration based on evidence you already have can be made in about two person-days using the process described above. The result is a summary like the examples included below. If the demonstration needs to be improved by collecting new evidence, more time is required to develop or locate measurement tools, for collection of evidence, and for its analysis. Other things being equal, the more time spent, the more the demonstration is improved. But note that often evidence to improve a demonstration may take only a modest amount of time to collect.

EVIDENCE THAT DEMONSTRATES EFFECTS

Many types of evidence can demonstrate effects. Some of the more common types are listed below:

- o test trainees before and after the training to see if they learned basic information or acquired important cognitive skills.
- o ask trainees to rate their beliefs or attitudes in specific areas that the training intends to change.
- o observe trainees working with children to see if they follow the practices and procedures the training emphasizes.
- o interview trainees in depth to see if they really understand the essential concepts of the training.
- o give trainees realistic problems to solve, to determine if they know how to go about it.
- o rate the quality of written products or other objects produced by trainees that reflect their learning.
- o ask trainees to rate their own learning or skills in specific areas, either in specific learning activities or the program as a whole.
- o observe trainees in their own classrooms before and after training to determine if desirable changes in practice occur.
- o analyze IEP's, behavior charts, or daily logbooks to see if trainees are implementing desirable practices.
- o observe children served by trainees to see if their learning activity changes in desirable ways, such as increased time on task.
- o ask supervisors of trainees, parents, peers, or children they serve to rate their ability and success.
- o look for changes in service delivery systems, resources, or other contextual changes caused by trainees.
- o identify highly successful (or less successful) trainees and do case studies of what went right (or wrong) in their training.
- o ask trainees how useful specific aspects of the training were in their jobs, or how well prepared they feel for their roles.
- o followup trainees to find out if they are employed in appropriate roles and to determine how many children they serve.

PLANNING YOUR DEMONSTRATION OF EFFECTS

A demonstration of effects can be started at any point in the development of a practice, though the best demonstrations are planned from the start of the developmental effort. To get started, a simple plan can be developed in three steps:

1. Identify claims of effectiveness. A series of statements should be made about the effects of the practice -- effects on trainees, effects on children, even effects on institutions. These claims should include statements about the direct, immediate effects of the practice on those it serves, but may also include statements about indirect, long-range impacts. Potential claims can be derived from many sources -- from proposals and other documents, from the values of staff, from participants, from funding agents, or from formal evaluations.

2. Assemble existing evidence to support claims. Unless your practice is just beginning development, you will have some data collected for various purposes that may be used to demonstrate effects. Identify each kind of information that is already available and review it carefully to see if it can be used as evidence to support any claims you wish to make. Also look at each claim, asking yourself if you have any evidence to support it.

3. Determine new evidence to be collected. Existing data collected for other purposes often does not furnish sufficient evidence to support all of the claims you wish to make. Review each claim in turn and ask yourself if the evidence you have convincingly supports it. If not, either restate the claim so that the evidence supports it, or identify new evidence that can be feasibly collected to support the claim as it is stated. Revise your evaluation plans and processes so that this evidence can be collected.

As the developmental effort proceeds, this plan is periodically reviewed and refined to verify that the final demonstration will be convincing. Prior to this review, a brief summary of claims and supporting evidence should be drafted. This interim demonstration may suggest revision of claims or future plans for the collection of evidence, and can also be disseminated to decision makers and other audiences. Several sample effectiveness summaries are included in this package.

We have used this format for developing a plan for demonstrating effects:

CLAIMS	EVIDENCE WE HAVE	EVIDENCE WE NEED

JUDGING THE EVIDENCE - SHOULD YOU BE CONVINCED?

A demonstration of effects presents evidence designed to convince some audience that a practice has achieved certain results. To be convincing, the demonstration must resolve three general questions, adapted from criteria which appear in the Joint Dissemination Review Panel Ideabook (1977).

Are there effects?

The evidence supporting each claim must be convincing. Two points are essential. First, the evidence presented must be directly related to the claim to be made. For example, if a program claims changes in classroom behavior after an inservice program, then the evidence should show that classroom behavior is different after the inservice than it was before. Evidence of changes in trainee beliefs, or even changes in child achievement do not support this claim. Second, the evidence must be collected in reliable and valid ways. Published instruments should match the claimed effect; instruments developed by the program should be tested before use; multiple data sources should be used wherever possible. Finally, appropriate statistical techniques should be used to demonstrate that the observed effects did not appear by chance.

Is the effect due to the practice?

Effects can be very real, but not necessarily caused by the practice that is claimed to produce them. A good demonstration rules out other plausible explanations for the observed effects or presents arguments showing how the effects must have resulted from the practice. For claims about child gains, a demonstration must show that normal maturation or the rest of the educational program did not lead to the observed effects; appropriate use of control groups may often be required for a convincing demonstration. For inservice education programs, a plausible demonstration should show that participants did not already have the skills; this often requires assessment prior to training. One convincing technique is to show that the program leads to the claimed effects through a series of direct, logical steps. For example, show that inservice training leads to specific changes in teacher classroom behavior which in turn, lead to specific changes in child learning behavior; then show that these changes in learning behavior lead to improved achievement.

Is the effect educationally significant?

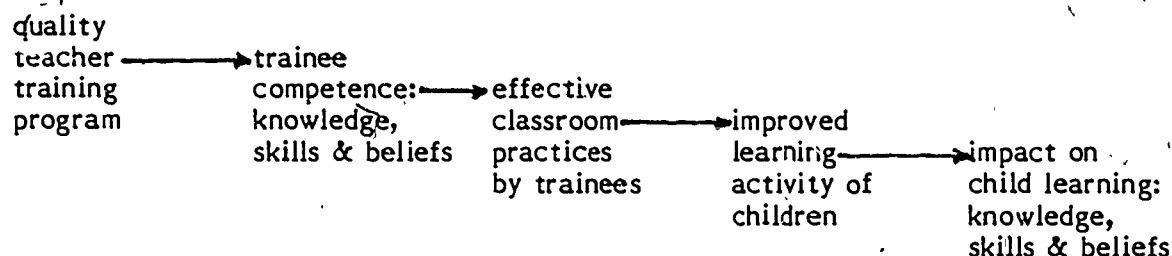
To be educationally significant, training effects should be related in some way to the needs of trainees or children. In particular, personnel preparation practices are educationally significant if they produce teacher abilities that are related to teacher effectiveness. The effects demonstrated should also be important enough or large enough to convince others that the results of the practice justify its cost. For example, a preservice program for teachers of the severely handicapped demonstrated that their graduates could apply behavioral management techniques. By citing research showing that such methods are essential to success with this population, this program also showed the educational significance of this skill. Demonstrating that a practice is as good as, or even better than, the competition also helps to show educational significance.

A MODEL FOR DEMONSTRATING TRAINING EFFECTS

Teacher educators often examine the effects of their training in a number of ways, such as knowledge tests, observation of trainees by faculty, and ratings of graduates by supervisors. It is less common to see coherent arguments that trace training effects to their eventual impact on the learning of children, even though that is clearly the ultimate purpose of most training. The purpose of this model is to briefly sketch one way in which such an argument can be made; the content is adapted from material originally presented in Thompson (1981).

A brief examination of research on the relationships among the training of teachers, their classroom behavior, and the learning of children suggests a general framework for studying both the intermediate and the ultimate effects of teacher training. The idea behind this model is that such effects are more plausibly demonstrated if the argument is broken down into several intermediate steps between training activity and child growth. Each step is claimed to affect the next, and the demonstration addresses the truth of each of these claims.

THE MODEL



The provider of teacher education directly controls only the activity that goes on within the training program itself. The provider determines the content, the mode of its delivery, the types of feedback given to trainees, the physical setting, and other aspects of the experience. Lectures, practica, classroom observations, seminars, workshops, peer work sessions, and individual assignments are some examples of activities that are commonly used.

It is claimed that participants in these activities gain certain knowledge, certain skills, or certain beliefs by the time the training is completed. These competencies are applied in the classrooms of trainees through the use of effective classroom practices. Such practices directly affect the many factors that impinge directly on the child, such as curriculum materials, the physical setting in the classroom, teacher instructional behaviors, or parent activities.

Effective classroom practices lead, it is claimed, to changes in learning activity of the student. Such changes might include more books read, more time spent on learning tasks, completion of assignments, or changes in study habits. Appropriate changes in the learning activity of children are claimed to improve learnings such as academic skills, social skills, motor skills, vocational skills, and the many other characteristics that educators seek to change.

As an example, consider a program which trains resource teachers. In demonstrating effects using this model, the program made the following claims:

That training activities were appropriate to program goals and were carried out as intended. The training program itself included a number of activities to develop skills in observation and charting, including both course content and supervised practice in field placements. Student Evaluation Scale ratings of these experiences indicate that, in the judgment of participants, activities were carried out as planned. A review by an Advisory Committee included in its findings a statement that program activities were appropriate to the goal of preparing competent resource teachers.

That the competence of trainees improved in the desired direction as a result of participation in training activities. Tests in several courses, a Teacher Practices Attitude Survey, and the practicum evaluation process indicated that the the great majority of students understood observation methods, were skilled in techniques of observation and charting, and believed in the value of doing so. A review of entry assessment information indicated that few trainees possessed these skills on entry into the program.

That trainees implement effective practices in their classrooms which are consistent with the training content. Surveys of graduates and of their supervisors indicate that most of those employed as resource teachers observed and charted some behaviors for each child in their class. Structured observation of the classes of a sample of graduates confirm these results.

That such classroom practices affect the learning activity of children in positive ways. Previous studies reviewed by program faculty indicated that the systematic observation and charting of child behavior leads to improved attention and increased time-on-task. This research finding is confirmed by several studies within the program of trainee impact in practicum settings.

That such changes in child learning activity lead to demonstrable positive impact on child learning. The studies reviewed indicate that improvements in attention and time-on-task are directly related to high rates of change in targeted academic and social behaviors. This relationship is also confirmed by studies within practicum settings served by trainees.

In this brief example, evidence from previous research is combined with information collected by the program itself to argue that the training of resource teachers in observation and charting is related to child learning. It should be clear that this argument does not conclusively prove that the training is the sole cause of the observed child learning and that it is seldom practical to do so. Training does not go on in isolation, but operates in a complex and value-charged context; many uncontrollable factors from this context affect each step in this model. These dimensions can intervene to break the chain of influence from teacher training to student at any point. The role of a demonstration of effect is not to provide definitive proof, but to provide plausible evidence of links at each step.

MEASUREMENT ISSUES IN DEMONSTRATING EFFECTS

A great variety of claims can be made about the effects of personnel preparation practices, and an even greater variety of evidence can be cited to support such claims. Some of the more common general claims are listed below, and alternative ways to evidence them suggested.

Claim: Trainees gain knowledge or cognitive skills from the training.

GOOD -- Claims about knowledge and cognitive skill are often evidenced by various forms of testing. For example, most preservice courses include final examinations, and many inservice courses include tests as well. In addition to the usual formats for testing recognition and recall, problem solving and other higher cognitive skills can be assessed by a variety of methods which depend upon the specific skill. For example, skill in developing individual educational plans can be assessed in a paper-and-pencil simulation by presenting certain information and asking the trainee to set goals, write objectives, and identify appropriate instructional activities. Ratings of knowledge may also be collected from the trainee or from others in a position to make such judgments.

BETTER -- Evidence supporting claims about knowledge and other cognitive skills is more convincing where the validity and accuracy of the measurement processes have been established. For example, items from knowledge tests can be pooled and their performance studied under repeated use. The domains of knowledge to be assessed can be explicitly described, and items derived systematically from such a specification. Information from past uses of an instrument or from practicing professionals can be used to set appropriate criteria on which scores can be judged. Situations within which cognitive skills are assessed can be made more realistic, or actual work samples can be reviewed for evidence of such skills. Evidence can not only be gathered from trainees, but can also be collected from graduates who are actually serving children.

Claim: Trainees gain performance skills from the training.

GOOD -- Performance skills are often judged by program faculty or by other professionals such as supervising teachers. These judgments are often collected as ratings of skill on a modest number of broad areas, such as "able to manage behavior effectively in the classroom." Self-ratings of performance skills are also used, but may be more indicative of self-concept than of actual level of skill.

BETTER -- Ratings of performance can be improved in a number of ways, including clearer specification of the skills to be judged, improved training of judges, and judging by several observers for reliability. In some circumstances, the level of inference required by the observer can be reduced by a more detailed (or even behavioral) specification of the skill to be assessed. In other cases, existing observation instruments that have been appropriately tested can be used in place of locally developed instruments, providing a broader framework for interpretation of the results. Performance assessment can often be improved by expanding the time or the frequency of observation, or by observing in settings closer to the actual classroom. Perhaps the strongest evidence of performance skill is that collected from graduates on-the job, rather than from trainees in process. Information showing learning gains by children are convincing, if indirect, evidence of teacher skills.

Claim: Trainees change beliefs or attitudes as a result of training.

GOOD -- Beliefs and attitudes are most often measured using self-reports of various kinds; trainees are asked to indicate their agreement with certain written statements, or are interviewed in a structured way. The general appropriateness of trainee attitudes may also be rated by others, such as a supervisor in a practicum.

BETTER -- Such measures of attitude and belief can often be improved by the usual psychometric procedures used to validate affective measures. The reliability of attitude survey instruments can be studied, and they can be given to practicing professionals to provide an additional reference point for interpreting results. Interviews can be structured and interviewers carefully trained, to improve the quality of information they provide.

Claim: Trainees are employed in positions appropriate to their training, providing appropriate services to handicapped children or making other worthwhile contributions.

GOOD -- Many preservice programs assist graduates in locating their first position, and if results are tracked, the program can summarize the positions first taken by graduates. Surveys of graduates often ask for position titles as well.

BETTER -- Such evidence can be improved through richer descriptions which go beyond position titles to some indication of the types of children served, the services provided, or the skills deployed. Followup studies can be repeated over time to estimate attrition from teaching positions. Results of extensive mail-out surveys can be validated by telephone interviews or visits to samples of graduates. Programs need to make an active effort to maintain contact with graduates in order to obtain such information at high rates of return, and such contact must also be reinforcing to graduates. This may require activities beyond data collection, such as maintaining an employment service, publishing a newsletter, or providing other information which will be of interest to the graduate.

Claim: Graduates implement effective teaching practices they were taught in their programs.

GOOD -- Surveys of graduates or of their supervisors can ask specific questions about what goes on in the classroom. Such surveys have included written ratings, telephone interviews, or face-to-face conversations.

BETTER -- General surveys can be improved by identifying and defining classroom practices that were emphasized in the training and focusing the survey on them. More convincing evidence of the use of effective classroom practices can be obtained through visits to graduates which include observations of classroom practice and in-depth interviews on training and successful teaching. Such visits can be conducted with a sample of graduates and used to validate the results of self-report or supervisor surveys.

SOURCES AND RESOURCES on DEMONSTRATING EFFECTS

Thompson, Elaine K. (ed). Using Student Change Data to Evaluate Inservice Education. Bloomington, Indiana: National Inservice Network, School of Education, Indiana University, 1981.

This report presents a general framework for looking at the effects of inservice education for teachers on the children these teachers serve. Pertinent evaluation questions about inservice education are mapped out, and the naturalistic and rationalistic paradigms for evaluation are compared. Seven distinct approaches are presented in detail. Summaries of effectiveness data for a few inservice programs are included, as well as an annotated resource list.

Duncan, J. R., Olsen, R. M. & Schofer, R. C. Comprehensive System of Personnel Development: Evaluation Considerations. Columbia, Missouri: Department of Special Education, University of Missouri, 1982.

This report includes specific information on evaluation questions and information sources for each aspect of CSPD. It also includes general information of evaluation methods in this context.

NOTE: ALSO MIGHT ADD TO THIS LIST --

The JDRP Ideabook

The ETC Instrument catalog

USOE material on validating achievement gains

A brief note on the National Diffusion Network

Dissemin/Action as a resource

State Dissemination Systems (the IVD process)